

MEMORANDUM TO MEMBERS AND CONSULTANTS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Summary Report of the February 15-16, 2011 Meeting

The major actions and approvals of the National Science Board (Board, NSB) and a preliminary summary of the proceedings at the Board's February 2011 meeting are provided. This memorandum is also made available for public review. The minutes of the Plenary Open Session for the February 2011 meeting will be posted on the Board's public Web site (<http://www.nsf.gov/nsb/>) following Board approval.

1. Major Actions and Approvals at the 418th NSB Meeting (not in priority order):

- a. The Board authorized the NSF Director, at his discretion, to increase the pass-through spending authority for foreign contributions to the Atacama Large Millimeter/submillimeter Array (ALMA), Associated Universities, Incorporated (AUI) (NSB-11-14).
- b. The Board authorized the NSF Director, at his discretion, to make an award for operation of the Atacama Large Millimeter/submillimeter Array (ALMA) to Associated Universities, Incorporated (AUI) (NSB-11-9).
- c. The Board authorized the Director, at his discretion, to make an award to Temple University for the Spatial Intelligence and Learning Center (SILC) (NSB-11-10).
- d. The Board authorized the Director, at his discretion, to make an award to the University of California, San Diego, for the Temporal Dynamics of Learning Center (TDLC) (NSB-11-11).
- e. The Board approved the Delegation of Award-Approval Authority to the NSF Director (NSB-11-2).
- f. The Board approved the Delegation of Authority to the Executive Committee (NSB-11-3).
- g. The Board approved the recipient for the 2011 Alan T. Waterman Award. The name of the awardee will be revealed in a public announcement this spring.
- h. The Chairman announced that the next annual Board retreat and off-site visit will be held in Tucson, Arizona on September 13-14, 2011.

- i. The Board approved the revised charge for the Committee on Programs and Plans (CPP), Task Force on Unsolicited Mid-Scale Research (MS) (NSB-10-59, Revised January 28, 2011).
- j. The Board approved the Committee on Strategy and Budget (CSB), Task Force on Data Policies (DP) Statement of Principles (NSB-11-20).
- k. The Board Chairman established the *ad hoc* Committee on Nominating for NSB Elections (Elections Committee) with Dr. Esin Gulari, chairman, and members Drs. France Córdova and Douglas Randall.
- l. The Board approved the minutes of the Plenary Open Session (NSB-10-89) for the December 2010 meeting (<http://www.nsf.gov/nsb/meetings/2010/1201/minutes.pdf>). Minutes for the Plenary Executive Closed (NSB-10-87) and Plenary Closed Sessions (NSB-10-88) for the December 2010 meeting of the Board were also approved.

2. Board Chairman's Report

Dr. Ray Bowen, NSB Chairman, reported that a procedure was in place for electronic participation of Board Members at meetings, which relates to the August 2010 Board approval of electronic participation by Board Members at various meetings of the Board.

The retreat, meeting, and research site-visit location for September 2011 will be held in Tucson, Arizona (See 1.h.). The Board agreed to this location during the Plenary Executive Closed Session of the December 2010 meeting.

On March 9, 2011, the Chairman and Dr. Subra Suresh, NSF Director, is scheduled to be on Capitol Hill to provide testimony to the House Committee on Science, Space, and Technology regarding the NSF FY 2012 Budget Request.

The *ad hoc* Committee on Nominating for NSB Elections, otherwise known as the Elections Committee, was established (See 1.k.). In May 2011, there will be two vacancies (for 2-year terms from 2011 to 2013) on the Executive Committee as the terms for Drs. Camilla Benbow and Patricia Galloway end.

Dr. Kelvin Droegemeier was nominated for reappointment as a Member of the National Science Board for a term expiring in May 2016. Dr. Droegemeier is the Vice President for Research, the Regent's Professor of Meteorology and Weathernews Chair Emeritus at the University of Oklahoma.

3. NSF Director's Report

Dr. Subra Suresh, NSF Director, introduced the following new NSF staff:

- ♦ Dr. Kelly Falkner, Deputy Director, Office of Polar Programs (OPP) (as of January 3, 2011).
- ♦ Mr. Jeffrey M. Lupis, Division Director, Division of Acquisition and Cooperative Agreement Support (DACCS), Office of Budget, Finance, and Award Management (BFA) (as of February 13, 2011).

- ♦ Dr. Theresa Maldonado, Division Director, Division of Engineering Education and Centers (EEC), Directorate for Engineering (ENG) (as of January 3, 2011).
- ♦ Dr. Ian Robertson, Division Director, Division of Materials Research (DMR), Directorate for Mathematical and Physical Sciences (MPS) (as of January 3, 2011).

For the congressional update, Dr. Suresh reported on the House of Representatives Continuing Resolution, which cuts \$100 billion overall from the President's FY 2011 Request. Under the bill, NSF's budget would be lower by \$360 million, or 5.2 percent, from the FY 2010 enacted level, and \$857.4 million, or 11 percent, below the President's FY 2011 request. These levels, if enacted, would put NSF marginally above the FY 2009 level. The current continuing resolution runs through March 4, 2011. Dr. Suresh reported that on March 9, he and Dr. Bowen are scheduled to testify before Congress; on March 10, he is scheduled to testify before the House Commerce, Justice, and Science Appropriations Subcommittee; and he is scheduled to testify before the Senate Commerce Committee the following week.

4. Board Committee Reports

[Note: The Executive Committee did not meet in February 2011.]

a. Committee on Audit and Oversight (A&O)

In A&O Open Session, Ms. Allison Lerner, NSF Inspector General, reported on her recent testimony to the House Appropriations Subcommittee on Investigations and Oversight.

Ms. Martha Rubenstein, NSF Chief Financial Officer, gave an update covering a variety of topics including follow up to the FY 2010 financial statement audit, internal controls, Office of Management and Budget (OMB) approval of plans for a new NSF financial system, and American Recovery and Reinvestment Act (ARRA) reporting successes.

The committee received an update on human capital management from Dr. Judith Sunley, Interim Chief Human Capital Officer. She noted the NSF progress on follow up actions based on the Office of Personnel Management (OPM) evaluation of NSF, a pending Office of Inspector General (OIG) audit, NSF's significant progress toward Model Equal Employment Opportunity (EEO) Agency status and the new NSF Veterans Employment Program.

The A&O Closed Session included a status update on a major pending procurement, an update on the future NSF headquarters project, and a discussion of steps taken to address an NSF IT security issue.

b. Committee on Education and Human Resources (CEH)

Committee members were informed about a study by the Government Accountability Office on Federal STEM education programs. The majority of meeting time was devoted to continuing the discussion begun at the December 2010 meeting on how NSF can achieve the goals of the *Innovators* report as well as leverage relevant recommendations of other recent STEM education reports. After a short presentation by Dr. Joan Ferrini-Mundy, Acting Assistant Director, Directorate for Education and Human Resources (EHR), committee members, in keeping with Dr. Suresh's call at the December 2010 meeting to identify "low-hanging" action items,

discussed several first-order priority areas. The committee agreed that a list of recommended action items would be finalized and conveyed to Dr. Suresh in May 2011.

c. Committee on Science and Engineering Indicators (SEI)

Dr. Myron Gutmann, Assistant Director, Directorate for Social, Behavioral, and Economic Sciences (SBE), presented his recommendations from the SBE review of the adult science knowledge measures reported in *Indicators*. For 2012, he recommended that the Board report data on all of the existing science knowledge questions and include a sidebar explaining the context for the SBE review and the Board's future plans. For 2014, he outlined plans for question experiments that would improve understanding of how to interpret the survey results. He also promised consultations with science and science education experts about the scientific adequacy of the current wording of the questions. For the longer term, he recommended work toward a new conceptual framework that would try to address how adults use science knowledge in practice.

SEI considered three possible cover designs for *Indicators* 2012. The committee also discussed the 2012 Companion Piece. To address doubts about whether the Companion Piece has sufficient impact to warrant the work involved in developing it, the SEI chairman asked the Board Office staff to assemble systematic data on references to past Companion Pieces. At the same time, the committee constituted a working group consisting of Drs. Esin Gulari, Louis Lanzerotti, José-Marie Griffiths, and Mr. Arthur Reilly to consider ideas for a possible Companion Piece on the science and engineering (S&E) workforce and innovation, including the relation between innovation and research and development (R&D).

d. Committee on Programs and Plans (CPP)

In CPP Open Session, the committee chairman reported on a January 2011 teleconference of the CPP and A&O, each committee individually voted on and recommended to the full Board the approval of a modification to the Board's current award threshold policy. The modification of the current policy would require Board approval for proposed awards where the average annual award amount is the greater of either 1 percent or more of the awarding Directorate's or Office's prior year current plan, or 0.1 percent or more of the prior year total of the NSF budget. The new threshold policy modification, along with the delegation of authority to the Executive Committee, was forwarded to the full Board for a vote in the Open Plenary session. CPP members agreed that changes would take effect immediately. [*The full Board subsequently approved both resolutions.*] (See 1.e.-f.)

Dr. Edward Seidel, Assistant Director, Directorate for Mathematical and Physical Sciences (MPS), gave an update on the status of the Large Hadron Collider (LHC). The LHC has been running at half energy since spring 2010, and 75 papers have been published. Dr. Seidel noted that LHC is expected to operate for another 20 years, and that the science is just beginning.

Dr. Joann Roskoski, Acting Assistant Director, Directorate for Biological Sciences (BIO), and Dr. Elizabeth Blood, Program Director, National Ecological Observatory Network (NEON), gave an update on the status of NEON's Airborne Observation Platform. Dr. Blood informed

the Board that the NEON spectrometer was designed and is currently under construction by the Jet Propulsion Laboratory (JPL), and NSF anticipates an on-time delivery in January 2012. The first test flights have been completed and data analysis is underway.

Dr. Barry Schneider, Program Director, Office of Cyberinfrastructure (OCI), presented an update on TeraGrid eXtreme Digital Resources for Science and Engineering (XD), and the rigorous review process. Two teams were awarded a planning grant for a year, and the grants were reviewed by a panel of 14 people, whose feedback was incorporated into the final proposal. OCI deemed the outcome of this process excellent, and the impact on computational data science and engineering is potentially transformative. NSF plans to bring an award for TeraGrid XD before the Board at the May 2011 meeting.

Dr. Timothy Killeen, Assistant Director, Directorate for Geosciences (GEO), and Dr. Robert Detrick, Division Director, Division of Earth Sciences (EAR) GEO, provided an update on the Incorporated Research Institutions for Seismology (IRIS). IRIS operates a distributed multi-user national facility in service of the earth sciences community. Dr. Detrick told the Board that a 27-month renewal proposal for IRIS was reviewed in fall 2010, a proposal for an integrated facility is due in the fall of 2012, and operations of the integrated facility are expected to begin in the fall of 2013. In 2017-2018, NSF expects a recompetition for awards for management and operations of all seismic facilities. NSF plans to bring an action item regarding IRIS renewal before the Board in May 2011.

Dr. Clifford Gabriel, Acting Director, Office of Integrative Activities (OIA), provided an update on the Experimental Program to Stimulate Competitive Research (EPSCoR) program's Research Infrastructure Improvement (RII) Track-1 awards. These awards had previously been scheduled to come before the Board at the May 2011 meeting as action items, but due to changes in the threshold policy. Dr. Gabriel noted that the RII Track 1 proposals are currently under review and will go to the Director's Review Board (DRB) in March 2011. NSF plans to present an information item on the DRB results at the May 2011 meeting.

In CPP Closed Session, the committee considered four action items and forwarded them to the full Board for approval:

- ♦ Increase in Pass-through Authority for Construction of the Atacama Large Millimeter/submillimeter Array (ALMA), Associated Universities, Inc. (AUI)
- ♦ Operation of the Atacama Large Millimeter/submillimeter Array (ALMA), Associated Universities, Inc. (AUI)
- ♦ Spatial Intelligence and Learning Center (SILC), Temple University
- ♦ Temporal Dynamics of Learning Center (TDLC), University of California, San Diego

[The full Board subsequently approved the above award resolutions.] (See 1.a. – 1.d.)

CPP Subcommittee on Polar Issues (SOPI)

Dr. Kelly Falkner, Deputy Director, Office of Polar Programs (OPP), informed the subcommittee of the untimely death last month of Mr. William Colston, Division Director, Antarctic Infrastructure and Logistics (AIL). She briefed SOPI on OPP-supported education-related activities, including the 2010 Joint Science Education Project, a collaboration involving Greenland, Denmark, and the U.S. Dr. Falkner also provided an update on the U.S. Antarctic Program (USAP) National Research Council panel reviewing Antarctic and South Ocean science

drivers over the next 2 decades. OPP received a proposal to extend the USAP prime contract an additional year through March 31, 2012.

Additionally, Dr. Falkner presented recent research highlights, noting the completion of IceCube construction on time and within budget; the successful *Oden-Nathaniel B. Palmer* operation in the Amundsen Sea sector; and enhancements of the EUMETSAT METOP data transfer capabilities, resulting in a doubling of the data upload rates for operational forecasts. A request for proposals was released by Raytheon Polar Services Company in mid-January 2011 for the contract on polar research vessel services. A University-National Oceanographic Laboratory System (UNOLS) committee has been charged with refreshing the science requirements for a polar research vessel, with a workshop scheduled later in February 2011. The U.S. Coast Guard and NSF have formed a working group to address a congressional requirement to prepare a business case analysis for refurbishing or building new icebreakers; the first meeting is scheduled for late February 2011.

Lastly, Dr. “Bud” Peterson presented an overview of the site-visit that he and some of his fellow Board Members took to Antarctica in December 2010.

CPP Task Force on Unsolicited Mid-Scale Research (MS)

A revision to the MS charge was discussed and approved by CPP on Monday, February 14, 2011. CPP approved a change to the upper limit of the ‘mid-scale’ definition. The new upper boundary was changed from “\$10 million per year” to “an amount that is typical for a center in that field.” [*The full Board subsequently approved the revised charge.*] (See 1.i.)

During the task force meeting, MS current and future activities were summarized. The task force is holding a series of Discussion Groups with both NSF staff and the research community. Additionally, the task force plans to conduct a survey of ‘mid-scale’ researchers to examine the relevant issues and questions. It will also hold a workshop on June 5-7, 2011 with key stakeholders from the research community, NSF staff, and other agencies to explore possible solutions.

e. Joint Committee on Programs and Plans / Committee on Strategy and Budget (Joint CPP-CSB)

In Joint CPP-CSB Open Session, the members reviewed overlapping interests regarding cyberinfrastructure planning and the 2011 NSF Facilities Plan. Dr. Alan Blatecky, Acting Director, Office of Cyberinfrastructure (OCI), presented information on NSF’s cyberinfrastructure planning, including investments for High Performance Computing (HPC) and a new initiative, Cyberinfrastructure for the 21st Century (CIF21), which was previewed in the NSF’s budget roll-out on Monday, February 14, 2011. CIF21 will aim to address current data challenges facing the science and engineering communities. It encompasses broad principles to strengthen the Nation’s cyberinfrastructure capabilities.

Dr. Mark Coles, Deputy Director, Large Facility Projects, presented the NSF Annual Facilities Plan to the joint committee members. Dr. Coles reviewed the various phases of the NSF large facility planning process and current status of NSF Major Research Equipment and Facilities Construction (MREFC) projects. Committee members felt the information presented by

Dr. Coles served as an informative precursor to the more extensive portfolio review that will follow in May 2011 under the purview of CSB.

In Joint CPP-CSB Closed Session, the joint committee discussed potential future MREFC projects. Dr. Coles presented further information on these projects and elaborated on the process involved with becoming an MREFC project.

f. Committee on Strategy and Budget (CSB)

CSB met in Open Session the day after the release of the President's FY 2012 budget request to Congress. It was noted that NSF maintains a strong position within the Administration as evident by the \$894 million increase over the FY 2010 enacted level budget, a total request level of \$7.67 billion. CSB will continue to follow the FY 2011 Appropriation and the FY 2012 budget processes.

Dr. Michael Van Woert, Executive Officer and Board Office Director, provided CSB with a brief update on NSB Office operations, in particular the office organization, overview of staff duties, and progress made on digitizing Board documents.

Dr. Gabriel provided CSB with an update on the NSF Strategic Plan, and reported that it had been publicly released on February 14, 2011 following OMB approval.

Mr. Michael Sieverts, Director, Budget Division (BD), BFA, made a presentation on NSF's Performance Plan integration with the Strategic Plan.

In CSB Closed Session, the committee discussed future budget development. Mr. Sieverts presented information on future budgets at this session.

CSB Subcommittee on Facilities (SCF)

The subcommittee discussed activities for 2011 include a required America COMPETES Act (ACA) report on mid-scale infrastructure, discussion of ACA recommendations to NSF on external partnering, and execution of the annual portfolio review of facilities. The SCF chairman outlined an approach for executing these activities. The subcommittee members discussed the scope of the tasks and the level of effort needed to complete them. SCF members concurred that the subcommittee should undertake both the mid-scale report and the annual portfolio review. SCF also identified a number of facility-related issues that require particular attention including consideration of science budgets, challenges for universities, plans for recompetition, partnering, and managing the MREFC process.

CSB Task Force on Data Policies (DP)

The task force meeting was devoted to an update from NSF liaisons. Dr. Seidel briefed task force members on activities of a new NSF internal working group that was set up to address both open data policies and issues related to open access publications. The DP chairman, working through the NSF Director, tasked the NSF group to look at the implications, costs and benefits to NSF of various alternatives, including (1) The Berlin Declaration should the NSF sign on, (2) the NSF adopting the National Institutes of Health (NIH) Open Access policies, and

(3) other approaches to Open Access, including the role of publishers, institutional repositories, and others. Dr. Seidel confirmed that the combination of data and scholarly publications is complicated, which is why the new NSF working group includes representation from different communities and cultures across NSF. Among other activities, the NSF group is considering pilot projects to demonstrate the types of policies that will allow NSF to lead the way in the digital world that is driving fundamental change in the nature of publication and communication.

CSB approved a motion to submit the Statement of Principles developed by DP to the full Board. *[The full Board subsequently approved the task force Statement of Principles.]* (See 1.j.)

g. Task Force on Merit Review (MR)

The MR chairman provided a brief summary of his discussion with the Committee on Equal Opportunities in Science and Engineering (CEOSE) last week, conveying their view of the importance of addressing broadening participation. The task force then discussed articulating overarching principles to guide the development of specific review criteria. The task force agreed to meet via teleconference in March and April 2011, with a goal of having draft recommendations in place by the May 2011 Board meeting.

[signed]
Michael L. Van Woert
Executive Officer